

Abstract

Enzymes from the group consisting of delta-12-desaturases catalyze an important step for the synthesis of multiple unsaturated fatty acids which are essential to humans and which, for all eukaryotes, serve as important structural elements of the cell membrane and control many vital processes in the organism. This concern essential nutrients, the need for which having to be covered mainly from plant and animal sources. Known organisms in which a delta-12-desaturase enzyme occurs naturally, originate exclusively from warm regions, therefore the production of fatty acids requires a supply of heat that is financially expensive and involves the use of extensive equipment. However, organisms also exist that have enzymes that are adapted to the cold. The invention thus relates to a nucleic acid sequence which codes for enzyme delta-12-desaturase, originates from the marine diatom *fragilariaopsis cylindrus* that is adapted to the cold, and which is formed according to SEQ ID. No. 1 or as a functional variant or as a segment having at least 8 nucleotides thereof. This results in the provision of a gene that is coded for an enzyme which has properties adapted to be cold and which is important for producing fatty acids thereby enabling a particularly economical production of fatty acids.

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